APPENDIX 4. TERMINOLOGY

U.S. GLOSSARY DEFINITIONS

Accuracy - In navigation, the accuracy of an estimated or measured position of a craft (vehicle, aircraft, or vessel) at a given time is the degree of conformance of the measured position with the true position of the craft at that time. Since accuracy is a statistical measure of performance, a statement of the accuracy of a navigation system is meaningless unless it includes a statement of the applicable uncertainty in position.

AFM - Means Federal Aviation Administration (FAA) approved airplane flight manual. This entire document is FAA approved and must be carried on all aircraft certificated under Federal Aviation Regulation (FAR) Part 25. The AFM contains operating procedures and limitations for the airplane and engine combination, as well as for all installed appliances, and must be readily accessible to the flightcrew during all operations.

Ambiguity - System ambiguity exists when the navigation system identifies two or more possible positions of the vehicle, with the same set of measurements, and no indication of which is the most accurate position. The potential for system ambiguities should be identified, along with a provision for users to identify and resolve them.

Anywhere fix - The ability of a receiver to start position calculations without being given an approximate location and approximate time.

Area navigation (RNAV) - Application of the navigation process providing the capability to establish and maintain a flight path on any chosen course that remains within the coverage area of the type of navigation sources being used. RNAV utilizing capabilities in the horizontal plane only is called 2D RNAV, while RNAV which also incorporates vertical guidance is called 3D VNAV. Time navigation (TNAV) may be added to either 2D or 3D systems. TNAV added to a 3D system is called 4D.

ARINC - An acronym for Aeronautical Radio Inc., a corporation largely owned by a group of airlines. ARINC is licensed by the Federal Communication Commission (FCC) as an aeronautical station, and contracted by the FAA to provide communication support for air traffic control (ATC) and meteorological services in portions of international airspace.

Availability - The availability of a navigation system is the percentage of time that the services of the system are usable by the pilot. Availability indicates the ability of the system to provide usable service within a specified coverage area. Signal availability is the percentage of time that navigation signals transmitted from external sources are available for use. Availability is a function of both the physical characteristics of the environment and the technical capabilities of the transmitter facilities.

Bandwidth - The range of frequencies in a signal.

C/A code - The standard (course/acquisition) global positioning system (GPS) code - a sequence of 1023 pseudo-random, binary, biphase modulation on the GPS carrier at a chip rate of 1.023 megahertz (MHz). Also known as the "civilian code."

Cabotage - The Standard Dictionary of the English language defines cabotage (for flight purposes) as "air transport of passengers and goods within the same national territory." The definition adopted by International Civil Aviation Organization [ICAO] at the Chicago Convention is, "Each state shall have the right to refuse permission to the aircraft of other contracting states to take on its territory passengers, mail, and cargo destined for another point within its territory."

Capacity - The number of system users that can be accommodated simultaneously.

Carrier - A signal that can be varied from a known reference by modulation

APPENDIX 4. TERMINOLOGY - Continued

U.S. GLOSSARY DEFINITIONS

Carrier aided tracking - A signal processing strategy that uses the GPS carrier signal to achieve an exact lock on the pseudo random code. This is more accurate than the standard approach.

Carrier frequency - The frequency of the unmodulated fundamental output of a radio transmitter.

Channel - A channel of a GPS receiver consists of the circuitry necessary to tune the signal from a single GPS satellite.

Chip - The transition time for individual bits in the pseudo-random sequence. Also, an integrated circuit.

Circular error probable (CEP) - A U.S. Department of Defense (DOD) specification in terms of accuracy. CEP is defined as the radius of a circle containing 50 percent of all possible fixes. Specification of radio navigation system accuracy generally refer to one or more of the following definitions.

a. *Predictable accuracy:* the accuracy (in NM or feet) of a position with respect to geographic or geodetic coordinates of the Earth. Predictable accuracy is also known as geodetic or absolute accuracy.

b. *Repeatable accuracy:* the accuracy (in feet) with which a user can return to a position whose coordinates have been measured at a previous time with the same navigation system.

c. *Relative accuracy:* the accuracy (in feet) with which a user can measure position relative to that of another user of the same navigation system at the same time. This may be expressed also as a function of the distance between two users. Relative accuracy may also refer to the accuracy with which a user can measure position relative to his own position in the recent past. For example, the present position of a craft whose desired track forms a specific geometric pattern on search operations will be measured generally with respect to a previously determined datum.

Class I airspace - Short-range navigation within the limits of the operational service volume of ground-based navigational aids (navaids).

Class II airspace - Long-range navigation beyond the limits of the operational service volume of ground-based navaids.

Clock bias - The difference between the clock's indicated time and true universal time.

Coast-out fix - A navaid (or intersection "fix"), sometimes called a coastal fix or gateway fix, whereby an aircraft transitions between the domestic route structure and the oceanic route structure, such as an organized track system (OTS) or air traffic service (ATS) volume of ICAO standard navaids.

Control segment - A world-wide network of GPS monitoring and control stations that ensure the accuracy of satellite positions and their clocks.

Convergence - A term used by controllers relative to the lateral separation of aircraft. Aircraft are determined to be converging if their lateral separation is becoming narrower in width.

Coverage - The coverage provided by a radio-navigation system is that surface area or space volume in which the signals are adequate to permit the user to determine position to a specified level of accuracy. Coverage is influenced by system geometry, signal power levels, receiver sensitivity, atmospheric noise conditions, surface conductivity, and other factors affecting signal availability.

Crosstrack error - The perpendicular deviation that the airplane is to the left or right of the desired track.

Cycle slip - A discontinuity in the measured carrier beat phase resulting from a temporary loss-of-lock in the carrier tracking loop of a GPS receiver.

APPENDIX 4. TERMINOLOGY - Continued

U.S. GLOSSARY DEFINITIONS

Data message - A message included in the GPS signal which reports the satellite's location, clock corrections, and health. Included is rough information on the other satellites in the constellation.

db - An abbreviation for decibels. It is a unit of relative power, voltage, or current, plotted on a logarithmic scale. An increase (or decrease) of 10 db means that something is either double (or half) of the original value. Db are used to compare one relative value to another.

Dead reckoning (DR) - Is a method of estimating the position of an aircraft without astronomical observations, based upon a previous known position and an estimate of the course and distance travelled within a given time increment. An estimation of the winds aloft is an integral part of the DR process.

Differential positioning - Precise measurement of the relative positions of two receivers tracking the same GPS signals.

Dilution of precision (DOP) - The multiplicative factor that modifies ranging error. It is caused solely by the geometry between the user and his/her set of satellites. Known as DOP or geometric dilution of precision (GDOP).

Domestic airspace - Airspace overlying the continental land mass of the United States, Alaska, Hawaii, and U.S. possessions. Domestic airspace extends to 12 nautical miles (NM) offshore.

Doppler aiding - A signal processing strategy that uses a measured Doppler shift to help the receiver smoothly track the GPS signal. Allows more precise velocity and position measurement.

Doppler shift - The apparent change in the frequency of a signal caused by the relative motion of the transmitter and receiver.

Drms - Refers to the "distance root mean square error." This fundamental parameter is the building block to the most common measure of navigation fix accuracy, "two (2) Drms."

En route - A phase of navigation covering operations between departure and arrival terminal phases.

Ephemeris - The predictions of current satellite position that are transmitted to the user in the data message.

Extended overwater - FAR Part 1 defines "extended overwater operation" for airplanes as an operation overwater at a horizontal distance of more than 50 NM from the nearest shoreline; and for helicopters, as an operation overwater at a horizontal distance of more than 50 NM from the nearest shoreline or more than 50 NM from an offshore heliport structure.

Fast-multiplexing channel (FMC) - A single channel which rapidly samples a number of satellite ranges. "Fast" means that the switching time is sufficiently fast (2 to 5 milliseconds) to recover the data message.

Frequency band - A particular range of frequencies.

Frequency spectrum - The distribution of signal amplitudes as a function of frequency.

Fix dimensions - This characteristic defines whether the navigation system provides a linear, one-dimensional line of position, two-dimensional, or three-dimensional position fix. The ability of the system to derive a fourth dimension (e.g., time) from the navigational signals is also included.

Fix rate - The fix rate is defined as the number of independent position fixes or data points available from the system per unit time.

Gateway fix - See "Coast-out fix."

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U.S. GLOSSARY DEFINITIONS

GDOP - Refers to geometric dilution of precision. The degree of uncertainty of a position fix with respect to the crossing angles of the lines of position (LOP).

Global Positioning System (GPS) - A long-range navigation system based on a constellation of 24 satellites orbiting the earth at a very high altitude that provide signals which through triangulation can identify a precise location.

Gross navigational error (GNE) - Pilots are expected to fly their aircraft along the centerline of their assigned route and to stay within the accuracy limits of their installed navigation systems. (For example, the accuracy tolerance limits for Loran-C equipment used in instrument flight rules (IFR) oceanic navigation is 5.8 NM). If an aircraft becomes off-course, it is usually for one of the following reasons; a "loop" (or communications) error between the pilot and the controller, a pilot intentionally entering a waypoint which is not along the assigned route of flight (e.g., a pilot deviation due to weather without prior ATC approval or without declaring an emergency), an unintentionally entered waypoint not along the assigned route, and a navigational equipment error or failure. Navigational errors that are greater than 20 NM are investigated by the various countries that provide ATC service.

Handlers - Individuals within specific countries who may be hired to accompany a flight and take care of the unique regulatory and cultural requirements associated with a flight into a foreign country. These individuals are locals who know the procedures and can assist in clearing customs, immigration, and airport security. These individuals also have varying degrees of expertise on other matters such as lodging, rental cars, flight restrictions, passenger ground travel, local prohibitions, health problems, etc.

High seas - Any body of water outside the 12 NM limit.

Handover word - The word in the GPS message that contains synchronization information for the transfer of tracking from the C/A to P-code.

IFR navigation - Navigation by electronic means or by use of a flight navigator. Navigation techniques may include use of ICAO standard navaids supplemented by accurate DR, pilot- operated electronic long-range navigation equipment, or use of a flight navigator. IFR oceanic (en route) navigation requires that the aircraft adhere to a particular level of navigational accuracy.

Independent fix - An independent fix means that a position does not depend on a previous or following measurement.

Independent receiver function - "Independent" means that the function of any part of a receiver does not depend upon the functioning of any part of another unit. Today's receivers can be single-sensor, multisensor, or "embedded" as part of a multifunction flight management (and navigation) system (FMS). A combined communication-navigation (com/nav) system meets the requirements for an independent navigation receiver.

Inertial navigation system (INS) - An RNAV system which is a form of self-contained navigation. See "Area navigation (RNAV)."

Integrity - Integrity is the ability of a system to provide timely warnings to users when the system should not be used for navigation.

Ionosphere - The band of charged particles 80 to 120 miles above the earth's surface.

Ionospheric refraction - The change in the propagation speed of a signal as it passes through the ionosphere.

L-band - The group of radio frequencies extending from 390 MHz to 1550 MHz. The GPS carrier frequencies (1227.6 MHz and 1575.42 MHz) are in the L-band.

APPENDIX 4. TERMINOLOGY - Continued

U.S. GLOSSARY DEFINITIONS

Minimum navigation performance specifications (MNPS) - A set of standards which require aircraft to have a minimum navigation performance capability in order to operate in MNPS designated airspace. In addition, aircraft must be certified by their state of registry for MNPS operation.

MNPS airspace - Designated airspace where MNPS procedures are applied between MNPS certified and equipped aircraft. MNPS airspace is located over certain areas of the North Atlantic (NAT) and over Northern Canada. An example is NAT MNPS airspace. This airspace is defined as the volume of airspace between flight level (FL) 275 and FL 400 bounded by certain geographical coordinates. To obtain MNPS approval, each operator must show compliance with the following conditions:

a. each aircraft is suitably equipped and capable of meeting MNPS standards;

b. operating procedures are established which ensure that MNPS standards are met; and

c. flightcrews are capable of operating with sufficient precision to consistently meet MNPS requirements and are aware of the emergency procedure specific to MNPS airspace.

Multichannel receiver - A GPS receiver that can simultaneously track more than one satellite signal.

Multipath error - Errors caused by the interference of a signal that has reached the receiver antenna by two or more different paths. Usually caused by one path being bounced or reflected.

Multiplexing channel - A channel of a GPS receiver that can be sequenced through a number of satellite signals.

Navigation - The means by which an aircraft is given guidance to travel from one known position to another known position.

Navigation guidance - The calculation of steering commands to maintain the desired track from the present aircraft position to a new position.

Navigation information - Aircraft parameters such as position, velocity vector and related data such as track angle, ground speed, and drift angle used for navigation guidance.

Navaids - Are visual or electrical devices which may be used while airborne or on the surface, which provides point-to-point guidance information or position data to an aircraft in flight. Examples of standard ICAO navaids include very high frequency (VHF) omnidirectional range (VOR), with or without distance measuring equipment (DME), and nondirectional ground-based beacons (NDB).

NM or nm - means distance measured in nautical miles. One nautical mile is equivalent to 6,080.27 feet and is the fundamental measurement unit used in both sea and air navigation. It is based on the length of a minute of arc along an arc of a great circle around the Earth.

Oceanic airspace - Airspace over the oceans of the world, considered international airspace, where ICAO oceanic separation and procedures are applied. Responsibility for the provisions of ATC service in this airspace is delegated to various countries based generally upon geographic proximity and the availability of the required resources.

Oceanic airspace - Airspace over the oceans of the world is considered international airspace where aircraft separation and air traffic procedures are standardized by ICAO. The responsibility for ATS in oceanic airspace is delegated to the various ICAO member States according to geographic proximity and availability of the required resources. Specific procedures are defined by ICAO Document 7030.

APPENDIX 4. TERMINOLOGY - Continued

U.S. GLOSSARY DEFINITIONS

Oceanic navigational error report (ONER) - A report filed when an aircraft exiting oceanic airspace has been observed by radar to be off course. ONER reporting parameters and procedures are contained in FAA Order 7110.82, "Monitoring of Navigational Performance in Oceanic Areas."

Offshore airspace - The airspace between the United States' 12 NM limit and the oceanic flight information region (FIR) boundary. An alternate definition is "within the limits of conventional land-based navaids."

Omega - An RNAV system designed for long-range navigation based upon ground-based electronic navaid signals.

Operational service volume - Defines the reception limits of VOR/DME and NDB navaids which are usable for random/unpublished route navigation and which are flight checked periodically to reconfirm these limits of coverage. The operational service volume of NDB's used in oceanic navigation; i.e., beyond the 75 NM standard service volume, must be individually flight checked and identified as such on the appropriate charts before they can be used for navigation.

Overwater - Section 91.511 of the FAR defines "overwater" as more than 30 minutes flying time or 100 NM from the nearest shore. This definition differs from the "extended overwater" definition found in FAR Part 1.

P-code - The precise or protected code. A very long sequence of pseudo-random binary biphase modulations on the GPS carrier at a chip rate of 10.23 MHz which repeats approximately every 267 days. Each 1 week segment of this code is unique to one GPS satellite and is reset each week.

Parallel offset path - A desired track parallel to, and left or right of, the "parent" track specified in nautical miles of offset distance.

Parent track - The planned track between two waypoints.

Parent waypoint - A waypoint used for route definition or progress reporting. The geographical position of a parent waypoint is not altered when RNAV equipment is operating in a parallel offset mode.

Pilotage - Aerial navigation by means of visual identification of landmarks.

POH - Pilot's Operating Handbook. The POH is the result of a 1976 industry-developed specification for the operation of FAR Part 23 certificated aircraft. Only Sections I and II of the POH are FAA-approved. These sections contain operating limitations for the airframe and engine combination. Section IX of the POH also contains additional operating instructions and FAA-approved limitations for all supplemental installed equipment, including Loran-C. Some type certificates issued for airplanes manufactured after 1977-1978 require that the POH be carried on the airplane (and therefore accessible to the pilot during flight) as a condition to meeting its type design.

Precise positioning service (PPS) - The most accurate dynamic positioning possible with GPS, based on the dual frequency P-code.

Primary navigation - See "Sole means of navigation." A "primary means" system is not required to reference a magnetic compass as it is totally independent of all other reference systems.

Pseudolite - A ground-based differential GPS receiver which transmits a signal like that of an actual GPS satellite and can be used for ranging. The data portion of the signal contains the differential corrections that can be used by other receivers to correct for GPS errors.

Pseudorandom code - A signal with random-noise like properties. It is a very complicated but repeated pattern of 1's and 0's.

APPENDIX 4. TERMINOLOGY - Continued
U.S. GLOSSARY DEFINITIONS

Pseudorange - A distance measurement based on the correlation of a satellite transmitted code and the local receiver's reference code, that has not been corrected for errors in synchronization between the transmitter's clock and the receiver's clock.

P-static - Is precipitation static, a form of background noise caused by rain, hail, snow, or dust storms in the vicinity of a receiving antenna, and measured at frequencies less than 10 MHz.

Reliability - The reliability of a navigation system is a function of the frequency that failures occur within the system. It is the probability that a system will perform its function within defined performance limits for a specified period of time under given operating conditions. Formally, reliability is one minus the probability of system failure.

Route - A defined path, consisting of a course in the horizontal plane, which aircraft transverse over the surface of the earth.

Satellite constellation - The arrangement in space of a set of satellites.

Selcal - Selective calling, a term used by the chart services on high/low altitude charts and others to indicate specific frequencies available for aircraft with selcal installed to be contacted on demand.

Self-contained navigation - Systems which are not dependent on external navigation sources on a continuous basis to determine position or navigation track. Self-contained navigation systems must be updated periodically with station-referenced or earth-referenced navigation systems to maintain their accuracy.

SNR - Signal-to-noise ratio. SNR is the ratio of the radio field intensity of a received radio wave to the radio noise field intensity received along with that signal.

Sole means air navigation systems - An approved navigation system that can be used for specific phases of air navigation without the need for any other navigation source.

Space segment - The part of the whole GPS system that includes the satellites and the launch vehicles.

Spread spectrum - A system in which the transmitted signal is spread over a frequency band much wider than the minimum band-width needed to transmit the information being sent. For GPS, this is done by modulating the carrier with a pseudo-random code.

Standard positioning service (SPS) - The normal civilian positioning accuracy obtained by using the single frequency C/A code.

State aircraft - Aircraft used exclusively in the service of any government or of any political subdivision thereof, including the government of any state, territory, or possession of the United States or the District of Columbia, but not including any government-owned aircraft engaged in carrying persons or property for commercial purposes.

Static positioning - Location determination when the receiver's antenna is presumed to be stationary in the earth. This allows the use of various averaging techniques that improve accuracy by factors of over 100.

Station referenced navigation - Position determination which is referenced to a stationary source.

Strap-down navigation equipment - Navigation equipment that is temporarily installed in an aircraft, usually for the purpose of ferry flights. The installation is FAA approved for "form, function and fit" and placed on FAA Form 337.

Supplemental air navigation system - An approved navigation system that can be used in conjunction with a sole-means navigation system.

APPENDIX 4. TERMINOLOGY - Continued
U.S. GLOSSARY DEFINITIONS

Standard service volume - Defines the reception limits of VOR/DME and NDB ground-based navaids which are usable for random/unpublished route navigation. Standard service volume is a calculated value that has not been flight checked. Coverage limits for VOR/DME systems are published in the "Federal Radio-navigation Plan," published biennially by the FAA and available to the pilot community.

Statistical measure of accuracy - Navigation system errors generally follow a known error distribution. Therefore, the uncertainty in position can be expressed as the probability that the error will not exceed a certain amount. A thorough treatment of errors is complicated by the fact that the total error is comprised of errors caused by instability of the transmitted signal, effects of weather and other physical changes in the propagation medium, errors in the receiving equipment, and errors introduced by the human navigator. In specifying or describing the accuracy of a system, human errors usually are excluded. Further complications arise because some navigation systems are linear (one-dimensional) while others provide two or three dimensions of position. When specifying linear accuracy, or when it is necessary to specify requirements in terms of orthogonal axes (e.g., along-track or crosstrack), the 95 percent (or two fl) confidence level is used. Vertical or bearing accuracies is specified in one-dimensional terms at the two fl, or 95 percent, confidence level. When two-dimensional accuracies are used, the 2 Drms (distance root mean square) uncertainty estimate is employed. Two Drms is twice the radial error or Drms. The radial error is defined as the root-mean-square value of the distances from the true location point of the position fixes in a collection of measurements. It is often found by first defining an arbitrarily-oriented set of perpendicular axes, with the origin at the true location point. The variances around each axis are then found, summed, and the square root computed. When the distribution of errors is elliptical, as it often is for stationary ground-based systems, these axes can be taken for convenience as the major and minor ellipse. Then the confidence level depends on the elongation of the error ellipse. The range of confidence levels is from 95 to 99 percent. As the error ellipse collapses to a line, the confidence level of the 2 Drms measurement approaches 95 percent.

System capacity - System capacity is the number of users that a system can accommodate simultaneously.

User interface - The way a receiver conveys information to the person using it. The controls and displays.

User segment - The part of the whole GPS system that includes the receivers of GPS signals.

VFR navigation - Navigation by pilotage (i.e., DR) or electronic means. There are no published accuracy standards for visual flight rules (VFR) oceanic (en route) navigation.

APPENDIX 4. TERMINOLOGY - Continued

A COMPARISON OF U.S. GLOSSARY DEFINITIONS THAT DIFFER WITH ICAO DEFINITIONS

Aircraft - Device(s) that are used or intended to be used for flight in the air, and when used in ATC terminology, may include the flightcrew.

[ICAO] Aircraft - Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.

Airport elevation - The highest point of an airport's usable runways measured in feet from mean sea level (MSL). See "Touchdown Zone."

[ICAO] Aerodrome elevation - The elevation of the highest point of the landing area.

Airport rotating beacon - A visual navaid operated at many airports. At civil airports, alternating white and green flashes indicate the location of the airport. At military airports, the beacons flash alternately white and green, but are differentiated from civil beacons by dual-peaked (two quick) white flashes between the green flashes. See "Special VFR operations" and/or "Instrument flight rules." (Refer to Airman's Information Manual (AIM), "Rotating Beacons")

[ICAO] Aerodrome beacon - Aeronautical beacon used to indicate the location of an aerodrome from the air.

Airport traffic control service - A service provided by a control tower for aircraft operating on the movement area and in the vicinity of an airport. See "Movement Area" and/or "Tower."

[ICAO] Aerodrome control service - ATC service for aerodrome traffic.

Air traffic - Aircraft operating in the air or on an airport surface, exclusive of loading ramps and parking areas.

[ICAO] Air traffic - All aircraft in flight or operating on the maneuvering area of an aerodrome.

Air traffic clearance - An authorization by ATC, for the purpose of preventing collision between known aircraft, for an aircraft to proceed under specified traffic conditions within controlled airspace. See "ATC instructions."

[ICAO] Air traffic control (ATC) clearance - Authorization for an aircraft to proceed under conditions specified by an ATC unit.

NOTE 1: For convenience, the term "ATC clearance" is frequently abbreviated to "clearance" when used in appropriate contexts.

NOTE 2: The abbreviated term clearance may be prefixed by the words taxi, takeoff, departure, en route, approach, or landing to indicate the particular portion of flight to which the ATC clearance relates.

Air traffic control (ATC) - A service operated by an appropriate authority to promote the safe, orderly and expeditious flow of air traffic.

[ICAO] Air traffic control (ATC) service - A service provided for the purpose of:

a. preventing collisions
   - between aircraft; and
   - on the maneuvering area between aircraft and obstructions; and

b. expediting and maintaining an orderly flow of air traffic.

APPENDIX 4. TERMINOLOGY - Continued

A COMPARISON OF U.S. GLOSSARY DEFINITIONS THAT DIFFER WITH ICAO DEFINITIONS

Air traffic control (ATC) specialist - A person authorized to provide ATC service. See "Air traffic control" and/or "Flight service station."

[ICAO] Controller - A person authorized to provide ATC services.

Airway - A CTA or portion thereof established in the form of a corridor, the centerline of which is defined by radio navigational aids. See "Federal airways." (Refer to FAR Part 71, AIM)

[ICAO] Airway - A CTA or portion thereof established in the form of corridor equipped with radio navigational aids.

Alternate airport - An airport at which an aircraft may land if a landing at the intended airport becomes inadvisable.

[ICAO] Alternate aerodrome - An aerodrome specified in the flight plan to which a flight may proceed when it becomes inadvisable to land at the aerodrome of intended landing.

NOTE: An alternate aerodrome may be the aerodrome of departure.

Altitude - The height of a level, point, or object measured in feet above ground level (AGL) or from MSL. See "Flight level."

a. MSL altitude is altitude expressed in feet measured from MSL.

b. AGL altitude is altitude expressed in feet measured AGL.

c. Indicated altitude is the altitude as shown by an altimeter. On a pressure or barometric altimeter it is altitude as shown uncorrected for instrument error and uncompensated for variation from standard atmospheric conditions.

[ICAO] Altitude - The vertical distance of a level, a point or an object considered as a point, measured from MSL.

Approach control service - ATC service provided by an approach control facility for arriving and departing VFR/IFR aircraft and, on occasion, en route aircraft. At some airports not served by an approach control facility, the air route traffic control center (ARTCC) provides limited approach control service. (Refer to AIM)

[ICAO] Approach control service - ATC service for arriving or departing controlled flights.

Approach sequence - The order in which aircraft are positioned while on approach or awaiting approach clearance.

[ICAO] Approach sequence - The order in which two or more aircraft are cleared to approach to land at the aerodrome.

Apron - A defined area on an airport or heliport intended to accommodate aircraft for purposes of loading and unloading passengers or cargo, refueling, parking, or maintenance. With regard to seaplanes, a ramp is used for access to the apron form the water.

[ICAO] Apron - A defined area, on a land aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, refuelling, parking or maintenance.

APPENDIX 4. TERMINOLOGY - Continued

A COMPARISON OF U.S. GLOSSARY DEFINITIONS THAT DIFFER WITH ICAO DEFINITIONS

Area navigation (RNAV) - A method of navigation that permits aircraft operation on any desired course within the coverage of station-reference navigation signals or within the limits of a self-contained system capability. Random area navigation routes are direct routes, based on area navigation capability, between waypoints defined in terms of latitude/longitude coordinates, degree/distance fixes, or offsets from published or established routes/airways at a specified distance and direction. The major types of equipment are described below.

a. VORTAC referenced or course line computer (CLC) systems, which account for the greatest number of RNAV units in use. To function, the CLC must be within the service range of a VORTAC.

b. Omega/VLF, although two separate systems, can be considered as one operationally. A long-range navigation system based upon very low frequency radio signals transmitted from a total of 17 stations worldwide.

c. INS are systems that are totally self-contained and require no information in response to signals resulting from internal effects on components within the system.

d. MLS area navigation (MLS/RNAV) provides area navigation with reference to an MLS ground facility.

e. Loran-C is a long-range radio navigation system that uses ground waves transmitted at low frequency to provide user position information at ranges of up to 600 to 1,200 NM at both en route and approach altitudes. The usable signal coverage areas are determined by the signal-to-noise ratio, the envelope-to-cycle difference, and the geometric relationship between the positions of the user and the transmitting stations.

[ICAO] Area navigation (RNAV) - A method of navigation which permits aircraft operation on any desired flight path within the coverage of station-referenced navigation aids or within the limits of the capability of self-contained aids, or a combination of these.

Automatic terminal information service (ATIS) - The continuous broadcast of recorded non-control information in selected terminal areas. Its purpose is to improve controller effectiveness and to relieve frequency congestion by automating the repetitive transmission of essential but routine information; e.g., "Los Angles information alpha. One three zero zero coordinated universal time. Weather, measured ceiling two thousand overcast, visibility three, haze, smoke, temperature seven one, dew point five seven, wind two five zero at five, altimeter two niner niner six. I-L-S runway two five left approach in use, runway two five right closed, advise you have alpha." (Refer to AIM)

[ICAO] Automatic terminal information service - The provision of current, routine information to arriving and departing aircraft by means of continuous and repetitive broadcasts throughout the day or a specified portion of the day.

Blind speed - The rate of departure or closing of a target relative to the radar antenna at which cancellation of the primary radar target by moving target indicator (MTI) circuits in the radar equipment causes a reduction or complete loss of signal.

[ICAO] Blind velocity - The radial velocity of moving target such that the target is not seen on primary radars fitted with certain forms of fixed echo suppression.

Broadcast - Transmission of information for which an acknowledgement is not expected.

[ICAO] Broadcast - A transmission of information relating to air navigation that is not addressed to a specific station or stations.

APPENDIX 4. TERMINOLOGY - Continued

A COMPARISON OF U.S. GLOSSARY DEFINITIONS THAT DIFFER WITH ICAO DEFINITIONS

Ceiling - The height above the earth's surface of the lowest layer of clouds or obscuring phenomena that is reported as "broken," "overcast," or "obscuration," and not classified as "thin" or "partial."

[ICAO] Ceiling - The height above the ground or water of the base of the lowest layer of cloud below 6,000 meters (20,000 feet) covering more than half the sky.

Clearance limit - The fix, point, or location to which an aircraft is cleared when issued an air traffic clearance.

[ICAO] Clearance limit - The point of which an aircraft is granted an ATC clearance.

Clearance void if not off by (time) - Used by ATC to advise an aircraft that the departure clearance is automatically canceled if takeoff is not made prior to a specified time. The pilot must obtain a new clearance or cancel his IFR plan if not off by the specified time.

[ICAO] Clearance void time - A time specified by an ATC unit at which a clearance ceases to be valid unless the aircraft concerned has already taken action to comply therewith.

Clutter - In radar operations, clutter refers to the reception and visual display of radar returns caused by precipitation, chaff, terrain, numerous aircraft targets, or other phenomena. Such returns may limit or preclude ATC from providing services based on radar. See "Target."

[ICAO] Radar clutter - The visual indication on a radar display of unwanted signals.

Compass locator - A low power, low or medium frequency (L/MF) radio beacon installed at the site of the outer or middle marker of an instrument landing system (ILS). It can be used for navigation at distances of approximately 15 miles or as authorized in the approach procedure.

a. Outer compass locator (LOM) is a compass locator installed at the site of the outer marker of an instrument landing system.

b. Middle compass locator (LMM) is a compass locator installed at the site of the middle marker of an instrument landing system.

[ICAO] Locator - an LM/MF NDB used as an aid to final approach.

NOTE: A locator usually has an average radius of rated coverage of between 18.5 and 46.3 km (10 and 25 NM).

Cruising altitude - An altitude or FL maintained during en route level flight. This is a constant altitude and should not be confused with a cruise clearance. See "Altitude."

[ICAO] Cruising level - A level maintained during a significant portion of a flight.

[ICAO] Danger area - An airspace of defined dimensions within which activities dangerous to the flight of aircraft may exist at a specified times.

NOTE: The term "Danger Area" is not used in reference to areas within the United States or any of its possessions or territories.

Decision height (DH) - With respect to the operation of aircraft, means the height at which a decision must be made during an ILS, MLS, or precision approach radar (PAR) instrument approach to either continue the approach or to execute a missed approach.

APPENDIX 4. TERMINOLOGY - Continued
A COMPARISON OF U.S. GLOSSARY DEFINITIONS THAT DIFFER WITH ICAO DEFINITIONS

[ICAO] Decision altitude (DA)/Decision height (DH) - A specified altitude or height (A/H) in the precision approach at which a missed approach must be initiated of the required visual reference to continue the approach has not been established.

NOTE 1: DA is referenced to MSL, and DH is referenced to the threshold elevation.

NOTE 2: The required visual reference means that section of the visual aids or of the approach area which should have been in view for sufficient time for the pilot to have an assessment of the aircraft position and rate of change of position, in relation to the flight path.

[ICAO] Estimated elapsed time - The estimated time required to proceed form one significant point to another. See "Total estimated elapsed time."

[ICAO] Estimated off-block time - The estimated time at which the aircraft will commence movement associated with departure.

Final approach - IFR - The flight path of an aircraft which is inbound to an airport on a final instrument approach course, beginning at the final approach fix or point and extending to the airport or the point where a circle-to-land maneuver or missed approach is executed. See "Segments of an instrument approach procedure."

[ICAO] Final approach - That part of an instrument approach procedure which commences at the specified final approach fix or point, or where such a fix or point is not specified,

a. at the end of the last procedure turn, base turn, or inbound turn of a racetrack procedure, if specified; or

b. at the point of interception of the last track specified in the approach procedure; and ends at a point in the vicinity of an aerodrome from which:

(1) a landing can be made; or

(2) a missed approach procedure is initiated.

Flight level (FL) - A level of constant atmospheric pressure related to a reference datum of 29.92 inches of mercury. Each is stated in three digits that represent hundreds of feet. For example, FL 250 represents a barometric altimeter indication of 25,000 feet; FL 255, an indication of 25,500 feet.

[ICAO] Flight level (FL) - A surface of constant atmospheric pressure which is related to a specific pressure datum, 1013.2 Hg " (1013.2mb), and is separated from other such surfaces by specific pressure intervals.

NOTE 1: A pressure type altimeter calibrated in accordance with the standard atmosphere:

a. When set to a en route FL (QNH) altimeter setting, will indicate altitude;

b. When set to a airport altitude (QFE) altimeter setting, will indicate height above QFE reference datum; and

c. When set to a pressure of 1013.2 Hg" (1013.2 mb), may be used to indicate FL's.

NOTE 2: The terms 'height' and 'altitude,' used in Note 1 above, indicate altimetric rather than geometric heights and altitudes.

Flight recorder - A general term applied to any instrument or device that records information about the performance of an aircraft in-flight or about conditions encountered in-flight. Flight recorders may make records of airspeed, outside air temperature, vertical acceleration, engine rotation per minute (RPM), manifold pressure, and other pertinent variables for a given flight.

APPENDIX 4. TERMINOLOGY - Continued

A COMPARISON OF U.S. GLOSSARY DEFINITIONS THAT DIFFER WITH ICAO DEFINITIONS

[ICAO] Flight recorder - Any type of recorder installed in the aircraft for the purpose of complementing accident/incident investigation. See ICAO Annex 6, Part I, for specifications relating to flight recorders.

General aviation - That portion of civil aviation which encompasses all facets of aviation except air carriers holding certificate of public convenience and necessity from the Civil Aeronautics Board and large aircraft commercial operators.

[ICAO] General aviation - All civil aviation operations other than scheduled air services and nonscheduled air transport operations for remuneration or hire.

Glideslope - Provides vertical guidance for aircraft during approach and landing. The glideslope/glidepath is based on the following:

a. Electronic components emitting signals which provide vertical guidance by reference to airborne instruments during instrument approaches such as ILS/MLS, or

b. Visual ground aids, such as visual approach slope indicator (VASI), which provide vertical guidance for a VFR approach or for the visual portion of an instrument approach and landing.

c. PAR. Used by ATC to inform an aircraft making a PAR approach of its vertical position (elevation) relative to the descent profile.

[ICAO] Glidepath - A descent profile determined for vertical guidance during a final approach.

Holding fix - A specified fix identifiable to a pilot by navaids or visual reference to the ground used as a reference point in establishing and maintaining the position of an aircraft while holding. (Refer to AIM)

[ICAO] Holding point - A specified location, identified by visual or other means, in the vicinity of which the position of an aircraft in flight is maintained in accordance with ATC clearances.

Homing - Flight toward a navaid, without correcting for wind, by adjusting the aircraft heading to maintain a relative bearing of zero degrees.

[ICAO] Homing - The procedure of using the direction-finding equipment of one radio station with the emission of another radio station, where at least one of the stations is mobile, and whereby the mobile station proceeds continuously towards the other station.

Instrument approach procedure (IAP) - A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing or to a point which a landing may be made visually. It is prescribed and approved for a specific airport by competent authority. See "Segments of an instrument approach procedure." (Refer to FAR Part 91, AIM)

a. U.S. civil standard instrument approach procedures are approved by the FAA as prescribed under FAR Part 97 and are available for public use.

b. U.S. military standard instrument approach procedures are approved and published by the DOD.

c. Special instrument approach procedure are approved by the FAA for individual operators but are not published in FAR Part 97 for public use.

[ICAO] Instrument approach procedure - A series of predetermined manoeuvres by reference to flight instruments with specified protection from obstacles from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding or en route obstacle clearance criteria apply.

Instrument flight rules (IFR) - Rules governing the procedures for conducting instrument flight. Also a term used by pilots and controllers to indicate type of flight plan. (Refer to AIM)

[ICAO] Instrument flight rules (IFR) - A set of rules governing the conduct of flight under instrument meteorological conditions.

Instrument runway - A runway equipped with electronic and visual navigation aids for which a precision or nonprecision approach procedure having straight-in landing minimums has been approved.

[ICAO] Instrument runway - One of the following types of runways intended for the operation of aircraft using instrument approach procedures:

a. *Nonprecision approach runway* - An instrument runway served by visual aids and nonvisual aid providing at least directional guidance adequate for a straight-in approach.

b. *Precision approach runway, Category I* - An Instrument runway served by ILS and visual aids intended for operations down to 60 m (200 feet) decision height and down to an runway visual range (RVR) of the other of 800 m.

c. *Precision approach runway, Category II* - An instrument runway served by ILS and visual aids intended for operations down to 30 m (100 feet) decision height and down to an RVR of the other of 400 m.

d. *Precision approach runway, Category III* - An instrument runway served by ILS to and along the surface of the runway and:

(1) Intended for operations down to an RVR of the order of 200 miles (no decision height being applicable) using visual aids during the final phase of landing;

(2) Intended for operations down to an RVR of the order of 50 miles (no decision height being applicable) using visual aids for taxing; and

(3) Intended for operations without reliance on visual reference for landing or taxiing.

NOTE 1: See Annex 10 Volume I, Part I Chapter 3, for related ILS specifications.

NOTE 2: Visual aids need not necessarily be matched to the scale of nonvisual aids provided. The criterion for the selection of visual aids is the conditions in which operations are intended to be conducted.

International airport - Relating to international flight, it means:

a. An airport of entry which has been designated by the Secretary of Treasury or Commissioner of Customs as an international airport for customs service.

b. A landing rights airport at which specific permission to land must be obtained from customs authorities in advance of contemplated use.

c. Airports designated under the Convention on International Civil Aviation as an airport for use by international commercial air transport and/or international general aviation. (Refer to Airport/ Facility Directory and/or International Flight Information Manual (IFIM))

[ICAO] International airport - Any airport designated by the contracting state in whose territory it is situated as an airport of entry and departure for international air traffic, where the formalities incident to customs, immigration, public health, animal and plant quarantine and similar procedures are carried out.

APPENDIX 4. TERMINOLOGY - Continued

A COMPARISON OF U.S. GLOSSARY DEFINITIONS THAT DIFFER WITH ICAO DEFINITIONS

Landing area - Any locality either on land, water, or structures, including airports/heliports and intermediate landing fields, which is used, or intended to be used, for the landing and takeoff of aircraft whether or not facilities are provided for the shelter, servicing, or for receiving or discharging passengers or cargo.

[ICAO] Landing area - That part of a movement area intended for the landing or takeoff of aircraft.

Minimum safe altitudes (MSA) -

a. The minimum altitude specified in FAR Part 91 for various aircraft operations.

b. Altitudes depicted on approach charts which provide at least 1,000 feet of obstacle clearance for emergency use within a specified distance from the navigation facility upon which a procedure is predicated. These altitudes will be identified as minimum sector altitudes or emergency safe altitudes and are established as follows:

(1) *Minimum sector altitudes* - Altitudes depicted on approach charts which provide at least 1,000 feet of obstacle clearance within a 25-mile radius of the navigation facility upon which the procedure is predicated. Sectors depicted on approach charts must be at least 90 degrees in scope. These altitudes are for emergency use only and do not necessarily assure acceptable navigational signal coverage.

(2) *Emergency safe altitudes* - Altitudes depicted on approach charts which provide at least 1,000 feet of obstacle clearance in non-mountainous area and 2,000 feet of obstacles clearance in designated mountainous areas with in 100-mile radius of the navigation facility upon which the procedure is predicated and normally used only in military procedures. These altitudes are identified on published procedures as "Emergency Safe Altitudes."

[ICAO] Minimum sector altitude - The lowest altitude which may be used under emergency conditions which will provide a minimum clearance of 300 miles (1,000 feet) above all obstacles located in an area contained within a sector of a circle of 46 km (25 NM) radius centered on a radio aid to navigation.

Mode - The letter or number assigned to a specific pulse of radio signals transmitted or received by ground interrogator or airborne transponder components of the Air Traffic Control Radar Beacon System (ATCRBS). Mode A (military Mode 3) and Mode C (altitude reporting) are used in ATC. See "Transponder" and/or "Radar." (Refer to AIM)

[ICAO] Mode (Secondary Surveillance Radar (SSR) Mode) - The letter or number assigned to a specific pulse spacing of the interrogation signals transmitted by an interrogator. There are 4 modes, A, B, C and D specified in Annex 10, corresponding to four different interrogation pulse spacings.

Movement area - The runways, taxiways, and other areas of an airport/heliport which are utilized for taxiing/hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading ramps and parking areas. At those airports/heliports with a tower, specified approval for entry onto the movement area must be obtained from ATC.

[ICAO] Movement area - That part of an aerodrome to be used for the takeoff, landing and taxiing of aircraft, consisting of the manoeuvreing area and the apron(s).

Night - The time between the end of evening civil twilight and the beginning of morning civil twilight, as published in the American Air Almanac, converted to local time.

APPENDIX 4. TERMINOLOGY - Continued

A COMPARISON OF U.S. GLOSSARY DEFINITIONS THAT DIFFER WITH ICAO DEFINITIONS

[ICAO] Night - The hours between the end of evening civil twilight and the beginning of morning civil twilight or such other period between sunset and sunrise as may be specified by the appropriate authority.

NOTE: Civil twilight ends in the evening when the center of the sun's disk is 6 degrees below the horizon and begins in the morning when the center of the sun's disk is 6 degrees below the horizon.

Notice to Airmen (NOTAM) - A notice containing information (not known sufficiently in advance to publicize by other means) concerning the establishment, condition, or change in any component (facility service, or procedure of, or hazard in the National Airspace System) the timely knowledge of which is essential to personnel concerned with flight operations.

a. *NOTAM(D)* - A NOTAM given (in addition to local dissemination) distant dissemination beyond the area of responsibility of the Flight Service Station. These NOTAM's will be stored and available until canceled.

b. *NOTAM(L)* - A NOTAM given local dissemination by voice and other means, such as telegraph and telephone, to satisfy local user requirements.

c. *FDC NOTAM* - A NOTAM regulatory in nature, transmitted by United States NOTAM office (USNOF) and given system wide dissemination.

[ICAO] NOTAM - A notice containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.

a. *Class I Distribution* - Distribution by means of telecommunication.

b. *Class II Distribution* - Distribution by means other than telecommunications.

Precision approach radar (PAR) - Radar equipment in some ATC facilities operated by FAA and/or the military services at joint-use civil/military locations and separate military installations to detect and display azimuth, elevation, and range of aircraft on the final approach course to a runway. This equipment may be used to monitor certain nonradar approaches, but is primarily used to conduct a PAR wherein the controller issues guidance instructions to the pilot based on the aircraft's position in relation to the final approach course (azimuth), the glidepath (elevation), and the distance (range) from the touchdown point on the runway as displayed on the radar scope. (Refer to AIM)--The abbreviation "PAR" is also used to denote preferential arrival routes in ARTCC computers.

[ICAO] Precision approach radar (PAR) - Primary radar equipment used to determine the position of an aircraft during final approach, in terms of lateral and vertical deviations relative to a nominal approach path, and in range relative to touchdown.

NOTE: Precision approach radars are designed to enable pilots of aircraft to be given guidance by radio communications during the final stages of the approach to land.

Prohibited area - See "Special Use Airspace."

[ICAO] Prohibited area - An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is prohibited.

Radar - A device which, by measuring the time interval between transmission and reception of radio pulses and correlating the angular orientation of the radiated antenna beam or beams in azimuth and/or elevation, provides information on range, azimuth, and/or elevation of objects in the path of the transmitted pulses.

APPENDIX 4. TERMINOLOGY - Continued
A COMPARISON OF U.S. GLOSSARY DEFINITIONS THAT DIFFER WITH ICAO DEFINITIONS

a. *Primary radar* - A radar system in which a minute portion of a radio pulse transmitted from a site is reflected by an object and then received back at that site for processing and display at an ATC facility.

b. *Secondary radar/Radar beacon (ATCRBS)* - A radar system in which the object to be tested is fitted with cooperative equipment in the form of a radio receiver/transmitter (transponder). Radar pulses transmitted from the searching transmitter/receiver (interrogator) site are received in the cooperative equipment and used to trigger a distinctive transmission from the transponder. This reply transmission, rather than a reflected signal, is then received back at the transmitter/receiver site for processing and display at an ATC facility. See "Transponder." (Refer to AIM)

[ICAO] Radar - A radio detection device which provides information on range, azimuth and/or elevation of objects.

a. *[ICAO] primary radar.* Radar System which uses reflected radio signals.

b. *[ICAO] secondary radar.* Radar system wherein a radio signal transmitted form a radar station initiates the transmission of a radio signal from another station.

Radar approach - An instrument approach procedure which utilizes PAR or Airport Surveillance Radar (ASR). See "Precision approach radar" and/or "Instrument approach procedure." (Refer to AIM)

[ICAO] Radar approach - An approach, executed by an aircraft, under the direction of a radar controller.

Radar contact -

a. Used by ATC to inform an aircraft that it is identified on the radar display and radar flight following will be provided until radar identification is terminated. Radar service may also be provided within the limits of necessity and capability. When a pilot is informed of "radar contact," he automatically discontinues reporting over compulsory reporting points. (Refer to AIM)

b. The term used to inform the controller that the aircraft is identified and approval is granted for the aircraft to enter the receiving controllers airspace.

[ICAO] Radar contact - The situation which exists when the radar blip or radar position symbol of a particular aircraft is seen and identified on a radar display.

Radar identification - The process of ascertaining that an observed radar target is the radar return from a particular aircraft. See "Radar contact" and/or "Radar service."

[ICAO] Radar identification - The process of correlating a particular radar blip or radar position symbol with a specific aircraft.

Radar service - A term which encompasses one or more of the following services based on the use of radar which can be provided by a controller to a pilot of a radar identified aircraft.

a. *Radar monitoring* - The radar flight-following of aircraft, whose primary navigation is being performed by the pilot, to observe and note deviations from its authorized flight path, airway, or route. When being applied specifically to radar monitoring of instrument approaches; i.e., with PAR or radar monitoring of simultaneous ILS/MLS approaches, it includes advice and instructions whenever an aircraft nears or exceeds the prescribed PAR safety limit or simultaneous ILS/MLS no transgression zone.

b. *Radar navigational guidance* - Vectoring aircraft to provide course guidance.

APPENDIX 4. TERMINOLOGY - Continued

A COMPARISON OF U.S. GLOSSARY DEFINITIONS THAT DIFFER WITH ICAO DEFINITIONS

c. *Radar separation* - Radar spacing of aircraft in accordance with established minima.

[ICAO] Radar service - Term used to indicate a service provided directly by means of radar.

[ICAO] Radar monitoring - The use of radar for the purpose of providing aircraft with information and advice relative to significant deviations from nominal flight path.

[ICAO] Radar separation - The separation used when aircraft position information is derived from radar sources.

Released time - A departure time restriction issued to a pilot by ATC (either directly or through an authorized relay) when necessary to separate a departing aircraft from other traffic.

[ICAO] Release time - Time prior to which an aircraft should be given further clearance or prior to which it should not proceed in case of radio failure.

Reporting point - A geographical location in relation to which the position of an aircraft is reported. (Refer to AIM)

[ICAO] Reporting point - A specified geographical location in relation to which the position of an aircraft can be reported.

Rescue coordination center (RCC) - A search and rescue (SAR) facility equipped and manned to coordinate and control SAR operations in an area designated by the SAR plan. The U.S. Coast Guard and the U.S. Air Force have responsibility for the operation of RCC's.

[ICAO] Rescue co-ordination center - A unit responsible for promoting efficient organization of SAR service and for coordinating the conduct of SAR operations within a SAR region.

[ICAO] Restricted area - An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is restricted in accordance with certain specified conditions.

Route segment - As used in ATC, a part of a route that can be defined by two navigational fixes, two navaids, or a fix and a navaid. See "Route."

[ICAO] Route segment - A portion of a route to be flown, as defined by two consecutive significant points specified in a flight plan.

Runway - A defined rectangular area on a land airport prepared for the landing and takeoff run of aircraft along its length. Runways are normally numbered in relation to their magnetic direction rounded off to the nearest 10 degrees; e.g., Runway 01, Runway 25.

[ICAO] Runway - A defined rectangular area on a land aerodrome prepared for the landing and takeoff of aircraft.

Segments of an instrument approach procedure - An instrument approach procedure may have many as four separate segments depending on how the approach procedure is structured.

a. *Initial approach* - The segment between the initial approach fix and the intermediate fix or the point where the aircraft is established on the intermediate course or final approach course.

b. *Intermediate approach* - The segment between the intermediate fix or point and the final approach fix.

APPENDIX 4. TERMINOLOGY - Continued
A COMPARISON OF U.S. GLOSSARY DEFINITIONS THAT DIFFER WITH ICAO DEFINITIONS

c. *Final approach* - The segment between the final approach fix or point and the runway, airport, or missed approach point.

d. *Missed approach* - The segment between the missed approach point or the point of arrival at decision height and the missed approach fix at the prescribed altitude. (Refer to FAR Part 97)

[ICAO] Initial approach segment - That segment of an instrument approach procedure between the initial approach fix and the intermediate approach fix or, where applicable, the final approach fix or point.

[ICAO] Intermediate approach segment - That segment of an instrument approach procedure between either the intermediate approach fix and the final approach fix or point, or between the end of a reversal, race track, or DR track procedure and the final approach fix point or point, as appropriate.

[ICAO] Final approach segment - That segment of an instrument approach procedure in which alignment and descent for landing are accomplished.

[ICAO] Missed approach procedure - The procedure to be followed if the approach cannot be continued.

Separation - In ATC, the spacing of aircraft to achieve their safe and orderly movement in flight and while landing and taking off.

[ICAO] Separation - Spacing between aircraft, levels or tracks.

Sigmet (WS) - A weather advisory issued concerning weather significant to the safety of all aircraft. Sigmet advisories cover severe and extreme turbulence, severe icing, and widespread dust or sandstorms that reduce visibility to less than 3 miles. (Refer to AIM)

[ICAO] Sigmet information - Information issued by a meteorological watch office concerning the occurrence or expected occurrence of specified en-route weather phenomena which may affect the safety of aircraft operations.

Special VFR operations - Aircraft operating in accordance with clearances within control zones in weather conditions less than the basic VFR weather minima. Such operations must be requested by the pilot and approved by ATC.

[ICAO] Special VFR flight - A controlled VFR flight authorized by ATC to operate within a control zone under meteorological conditions below the visual meteorological conditions.

Target - The indication shown on a radar display resulting from a primary radar return or a radar beacon reply.

[ICAO] Target - In radar:

a. Generally, any discrete object which reflects or retransmits energy back to the radar equipment.

b. Specifically, an object of a radar search or surveillance.

[ICAO] Total estimated elapsed time - For IFR flights, the estimated time required from take off to arrive over that designated point, defined by reference to navigation aids, from which it is intended that an instrument approach procedure will be commenced, or, if no navigation aid is associated with the destination aerodrome, to arrive over the destination aerodrome. For VFR flights, the estimated time required from takeoff to arrive over the destination aerodrome.

APPENDIX 4. TERMINOLOGY - Continued

A COMPARISON OF U.S. GLOSSARY DEFINITIONS THAT DIFFER WITH ICAO DEFINITIONS

Touchdown -

a. The point at which an aircraft first makes contact with the landing surface.

b. Concerning a PAR, it is the point where the glide path intercept the landing surface.

[ICAO] Touchdown - The point where the nominal glide path intercepts the runway.

NOTE: Touchdown as defined above is only a datum and is not necessarily the actual point at which the aircraft will touch the runway.

Touchdown zone - The first 3,000 feet of the runway beginning at the threshold. The area is used for determination of touchdown zone elevation in the development of straight-in landing minimums for instrument approaches.

[ICAO] Touchdown zone - The portion of a runway, beyond the threshold, where it is intended landing aircraft first contact the runway.

Tower (ATCT) - A terminal facility that uses air/ground communications, visual signaling, and other devices to provide ATC services to aircraft operating in the vicinity of an airport or on the movement area. Authorizes aircraft to land or takeoff at the takeoff at the airport controlled by the tower or to transit the airport traffic area regardless of flight plan or weather conditions (IFR or VFR). A tower may also provide approach control services (radar or nonradar). (Refer to AIM)

[ICAO] Aerodrome control tower - A unit established to provide ATC service to aerodrome traffic.

Track - The actual flight path of an aircraft over the surface of the earth. See "Route."

[ICAO] Track - The projection on the earth's surface of the path of an aircraft, the direction of which path any point is usually expressed in degrees from north (true, magnetic, or grid).

Traffic pattern - The traffic flow that is prescribed for aircraft landing at, taxiing on, or taking off from an airport. The components of a typical traffic pattern are upwind leg, crosswind leg, downwind leg, and final approach.

a. *Upwind leg* - A flight path parallel to the landing runway in the direction of landing.

b. *Crosswind leg* - A flight path at right angles to the landing runway off its upwind end.

c. *Downwind leg* - A flight path parallel to the landing runway in the direction opposite to landing. The downwind leg normally extends between the crosswind leg and the base leg.

d. *Base leg* - A flight path at right angles to the landing runway off its approach end. The base leg normally extends from the downwind leg to the intersection of the extended runway centerline.

e. *Final approach* - A flight path in the direction of landing along the extended runway centerline. The final approach normally extends from the base leg to the runway. An aircraft making a straight-in approach VFR is also considered to be on final approach (Refer to AIM and/or FAR Part 91).

[ICAO] Aerodrome traffic circuit - The specified path to be flown by aircraft operating in the vicinity of an aerodrome.

Transfer of control - That action whereby the responsibility for the separation of an aircraft is transferred from one controller to another.

[ICAO] Transfer of control - Transfer of responsibility for providing ATC service.

APPENDIX 4. TERMINOLOGY - Continued
A COMPARISON OF U.S. GLOSSARY DEFINITIONS THAT DIFFER WITH ICAO DEFINITIONS

Transferring controller - A controller/facility transferring control of an aircraft to another controller/facility.

[ICAO] Transferring unit/controller - ATC unit/air traffic controller in the process of transferring the responsibility for providing ATC service to an aircraft to the next ATC unit/air traffic controller along the route of flight.

Transponder - The airborne radar beacon receiver/transmitter portion of the ATCRBS which automatically receives radio signal from interrogators on the ground, and selectively replies with a specific reply pulse or pulse group only to those interrogations being received on the mode to which it is set to respond (Refer to AIM).

[ICAO] Transponder - A receiver/transmitter which will generate a reply signal upon proper interrogation; the interrogation and reply being on different frequencies.

Urgency - A condition of being concerned about safety and of requiring timely but not immediate assistance; a potential distress condition.

[ICAO] Urgency - A condition concerning the safety of an aircraft or other vehicle, or of person on board or in sight, but which does not require immediate assistance.

Vector - A heading issued to an aircraft to provide navigational guidance by radar.

[ICAO] Radar vectoring - Provisions of navigational guidance to aircraft in the form of specific headings, based on the use of radar.

Vertical separation - Separation established by assignment of different altitudes or FL's.

[ICAO] Vertical separation - Separation between aircraft expressed in units of vertical distance.

[ICAO] Visibility - The ability, as determined by atmospheric conditions and expressed in units of distance, to see and identify prominent unlighted objects by day and prominent objects by night.

a. *[ICAO] Flight visibility* - The visibility forward from the cockpit of an aircraft in flight.

b. *[ICAO] Ground visibility* - The visibility at an aerodrome as reported by an accredited observer.

c. *[ICAO] Runway visual range (RVR)* - The range over which the pilot of an aircraft on the center line of a runway can see the runway surface markings or the lights delineating the runway or identifying its center line.

Visual approach - An approach wherein an aircraft on an IFR flight plan, operating in VFR conditions under the control of an ATC facility and having an ATC authorization, may proceed to the airport of destination in VFR conditions.

[ICAO] Visual approach - An approach by an IFR flight when either part or all of an instrument approach procedure is not completed and the approach is executed in visual reference to terrain.

APPENDIX 4. TERMINOLOGY - Continued

GPS ACRONYMS

The following acronyms are listed to assist the reader referencing technical documents relating to Global Positioning Systems (GPS). This list does not claim to be all inclusive, but it will assist interested readers in understanding the extensive amount of literature being written concerning this relatively new navigation concept.

2-D	Two-Dimensional
2DRMS	2 Distance Root Mean Square
3-D	Three-Dimensional
A-S	Anti Spoof
AEEC	Airlines Electronic Engineering Committee
AFSPACECOM	Air Force Space Command
AOC	Auxiliary Output Chip
AOPA	Aircraft Owners and Pilots Association
ATA	Air Transport Association
AVCS	Attitude and Velocity Control Subsystem
BPSK	Binary Phase-Shift Keying
C/A-CODE	Course Acquisition Code
CCMDR	Crew Commander
CDU	Control/Display unit
CEP	Circular Error Probable
CONUS	Conterminous United States
CPCI	Computer Program Configuration Item
DGIC	Differential GPS Integrity Channel
DGPS	Differential GPS
DOD	Department of Defense
DOP	Dilution of Precision
ECEF	Earth Centered, Earth Fixed
EPS	Electric Power System
f	Frequency
FAA	Federal Aviation Administration
FAATC	FAA Technical Center - Atlantic City, New Jersey
FANS	Future Air Navigation System
FCMDR	Flight Commander
FOC	Full Operational Capacity
FRP	Federal Radionavigation Plan
GA	Ground Antenna
GDOP	Geometric Dilution of Precision
GIB	GPS Integrity Broadcast
GIC	GPS Integrity Channel
GLOSNASS	Global Navigation Satellite System (Russian System)
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
GSO	Ground Systems Officer
HDOP	Horizontal Dilution of Precision
HOW	Handover Word
Hr	Hour
Hz	Hertz

APPENDIX 4. TERMINOLOGY - Continued

GPS ACRONYMS

ICAO	International Civil Aviation Organization
ICD	Interface Control Document
ILS	Instrument Landing System
INS	Inertial Navigation System
LBS	L-Band System
LDGPS	Local-area Differential GPS
LOP	Line of Position
m	Meter(s)
m/s	Meters/Second
MCS	Master Control Station
MHz	Megahertz
MOPS	Minimum Operational Performance Standards
MS	Monitor Station
NAS	National Airspace System
NASA	National Aeronautics and Space Administration
NDS	Nuclear Detection Subsystem
NPD	Navigation Payload Subsystem
OASD/C31	Office of the Assistant Secretary of Defense (Communications, Command, Control and Intelligence)
OIS	Orbital Insertion System
P-CODE	Precise-Code
PCS	Prelaunch Checkout Station
PDOP	Position Dilution of Precision
POC	Point of Contact
PPS	Precise Positioning Service
PPS-SM	Precise Positioning Service Security Module
PR	Pseudo Range
PRN	Pseudo Random Noise
RAIM	Receiver Autonomous Integrity Monitoring
RCS	Reaction Control System
RMS	Root Mean Square
RNP	Required Navigation Performance
RSS	Root Sum Square
SA	Selective Availability
SAO	Satellite Analysis Office
sec	Second(s)
SEO	Satellite Engineering Office
SEP	Spherical Error Probability
SF	Sub Frame
SOIT	Satellite Operational Implementation Team
SOO	Satellite Operations Officer
SPS	Standard Positioning Service
SS	Support Structure
SV	Space Vehicle
TCS	Thermal Control Subsystem
TDOP	Time Dilution of Precision

APPENDIX 4. TERMINOLOGY - Continued
GPS ACRONYMS

TERPS	U.S. Standard for Instrument Procedures (FAA Order 8260.3B)
TLM	Telemetry Word
TOA	Time of Arrival
TSO	Technical Standard Order
TT&C	Telemetry, Tracking and Command Subsystem
UERE	User Equivalent Range Error
UTC	Coordinated Universal Time
VDOP	Vertical Dilution of Precision
VLF	Very Low Frequency
VOR/DME	Very High Frequency Omnidirectional Range/Distance Measuring Equipment
WAAS	Wide-Area Augmentation System
WADGPS	Wide-Area Differential GPS (NOTE: Some references use WDGPS in lieu of WADGPS.)
Wx	Weather

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